Title: Time variability of the vertical component of wind speed and its relationship to other meteorological variables in the Czech Republic

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Abstract: The large-scale vertical velocity of the horizontal scale up to thousands of kilometers has been studied in the presented study. These „centimeters“ motions have a significant interest in the formation of cloud and precipitation bands in midlatitudes frontal cyclones. The formation and distribution of large-scale vertical motion in the frontal midlatitude cyclone are mentioned. For the statistical analysis, the data from the reanalysis project ECMWF ERA-40 were used for the Czech territory from 1957 – 2002. From March to July, higher frequency of ascend motions was found. In contrast, descent motions dominated. between September and January. Interannual variability of vertical velocity showed increased frequency of descent motions in the period 1972 – 1982 and increasing frequency of ascend motions between 1983 – 1988. Relationship of vertical velocity and high precipitation has a moderate correlation with exponential regression. Relationship of absolute vorticity advection and vertical velocity have a weak negative correlation.

Keywords: vertical motions, frontal cyclone, areal precipitation, vorticity, ERA-40